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SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND COMPUTER SYSTEM WHICH UTILIZED THIS

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Abstract

Objective

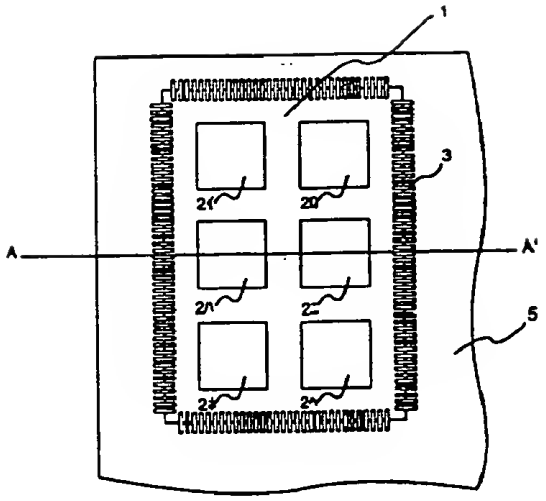
To provide a semiconductor integrated circuit device and compositional method for a high-speed computer system which overcomes the problems in the conventional module mounting technology in the computer mounting technology.

Constitution

A plurality of LSI chips, for example, six LSI chips (2a)-(2f) are loaded on large LSI (1) integrated with circuit elements in approximately the same number as LSI chips (2a)-(2f), and LSI chips (2a)-(2f) are connected via the logic circuit provided to large LSI (1). When composing a computer system, a plurality of LSI chips composing a plurality of instruction processors are loaded on the principal surface of the large LSI composing the cash directory memory device, arbitration circuit of system controller, etc., LSI chip composing the cash memory device is also loaded, and these are connected electrically.

Effect

A large-scale system can be made compact, and accessing the system controller from the instruction processor can be executed at a high speed.



Claims

1. A semiconductor integrated circuit device characterized by the fact that in a semiconductor integrated circuit device composed by loading a plurality of second semiconductor integrated circuit devices on the principal surface of the first semiconductor integrated circuit device, a connecting circuit was provided which includes an active element for mutually connecting the logic circuits within said second semiconductor integrated circuit devices.

2. A semiconductor integrated circuit device characterized by the fact that in the semiconductor integrated circuit device noted in Claim 1, the number of logic circuit elements integrated in said first integrated circuit device is the same or less than that in one of the said second semiconductor integrated circuit devices.

3. A semiconductor integrated circuit device characterized by the fact that in the semiconductor integrated circuit device noted in Claim 1 or 2, said first semiconductor integrated circuit device is loaded on a wiring substrate and said first semiconductor integrated circuit device and said wiring substrate are TAB connected.

4. A semiconductor integrated circuit device characterized by the fact that in the semiconductor integrated circuit device noted in Claim 1 or 2, said first semiconductor integrated circuit device has at least one layer of high density wiring layer with thickness of 1 μm or less and at least one layer of low-resistance wiring layer with thickness of 2 μm.

5. A semiconductor integrated circuit device characterized by the fact that in the semiconductor integrated circuit device noted in Claim 4, the wiring of said high density wiring layer uses aluminum as the material thereof and the wiring of said low resistance wiring layer uses copper as the material thereof.

6. A manufacturing method for semiconductor integrated circuit device characterized by the fact that a first semiconductor integrated circuit device is formed provided with a low resistance wiring layer and a circuit containing active element,

A plurality of second semiconductor integrated circuit devices, each with a logic circuit, are formed; these are loaded on the principal surface of said first semiconductor integrated circuit device, and

the logic circuits of said second semiconductor integrated circuit devices are connected via the low-resistance wiring layer and said circuit of said first semiconductor integrated circuit device.

7. A manufacturing method for semiconductor integrated circuit device characterized by the fact that in the manufacturing method for semiconductor integrated circuit device noted in Claim 6, said low-resistance wiring layer is formed according to metal plating.

8. A manufacturing method for semiconductor integrated circuit device characterized by the fact that in the manufacturing method for semiconductor integrated circuit device noted in Claim 7, said low resistance wiring layer is formed according to copper plating.

9. A computer system characterized by the fact that in a computer system provided with an instruction processor, a principal memory device, an input/output device, an input/output controller connected to said input/output device, and a system controller which mutually connects said instruction processor, said principal memory device, and said input/output controller,

said instruction processor and said system controller were provided to a semiconductor integrated circuit device loaded with a plurality of semiconductor integrated circuit devices on the principal surface of a first semiconductor integrated circuit device.

10. A computer system characterized by the fact that in the computer system noted in Claim 9, said instruction processor is composed with said second semiconductor integrated circuit device and said system controller is provided to said first semiconductor integrated circuit device.

11. A computer system characterized by the fact that in the computer system noted in Claim 9, one part of the circuit composing said system controller is composed within said second semiconductor integrated circuit device.

12. A computer system characterized by the fact that in the computer system noted in Claim 9, 10, or 11, the signal line between the circuits within said instruction processors provided to said plurality of second semiconductor integrated circuit devices and the logic circuit on said signal line are formed in said first semiconductor integrated circuit device.

13. A computer system characterized by the fact that in the computer system noted in Claim 9 or 11, the signal line between one part of said system controller and said instruction processor provided to said plurality of second semiconductor integrated circuit devices and the logical circuit on said signal line are formed in said first semiconductor integrated circuit device.

14. A computer system characterized by the fact that in the computer system noted in Claim 9 or 11, the signal line which connects between the circuit within said system controllers provided to said plural second semiconductor integrated circuit devices and the logic circuit on said signal line are formed in said first semiconductor integrated circuit device.

15. A computer system characterized by the fact that in the computer system noted in Claim 12, 13, or 14, the logic circuit on the signal line formed in said first semiconductor integrated circuit device includes at least a latch and makes pipe line transmission possible.

16. A computer system characterized by the fact that in the computer system noted in Claim 9, 10, or 11, the first semiconductor integrated circuit device provided to said system controller is plurally provided and said system controllers are mutually connected.

17. A computer system characterized by the fact that in the computer system noted in Claim 11, one part of the circuit

composing said system controller and said instruction processor were composed within the same second semiconductor integrated circuit device.

18. A computer system characterized by the fact that in the computer system noted in Claim 11, one part of the circuit constituting said system controller is composed in one of said plurality of second semiconductor integrated circuit devices and said instruction processor is composed within another second semiconductor integrated circuit device.

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